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AUTHOR Rodekohr, Sherie; Harris, Clark Richard
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ABSTRACT

This handbook on identifying and selecting landscape plants can be used as a reference in landscaping courses or on an individual basis. The first of two sections, Identifying Plants for the Landscape, contains the following tables: shade tree identification; flowering tree identification; evergreen tree identification; flowering shrub identification; evergreen shrub identification; ground cover and vine identification; perennial identification; and turfgrass identification. For plants listed in these tables, the following information is provided: common name, botanical name, form, branching habit, growth habit, stem, buds, leaf arrangement, venation, type of leaf, leaf shape, margin shape, tip shape, base shape, leaf color, bark characteristics, leaf surface, and unique characteristics. The second section, Selecting Plants for the Landscape, contains the following tables: shade tree selection; flowering tree selection; evergreen tree selection; flowering shrub selection; evergreen shrub selection; ground cover and vine selection; perennial selection; and turfgrass selection. For plants in these tables, some or all of the following information is given: common name, botanical name, height, width, form, growth rate, hardiness zone, use in landscape, texture, leaf color, flowering color, length of bloom, fruiting time/type, fertilizer requirements, soil conditions, water requirements, light requirements, temperature requirements, transplantability, disease problems, insect problems, pruning method/time, special considerations, life span, and unique characteristics. A list of 23 references is included. (NLA)

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MISSOURI AGRICULTURAL EDUCATION

Identifying and Selecting Plants
for the Landscape

COMMON NAME	TEMPERATURE REQUIREMENTS	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS
Red Maple	tolerates city heat and glare	easy; B & B and bareroot; spring		leaf hoppers
Sugar Maple	to zone			
River Birch	to zone			
European White Birch	to zone			
Green Ash	to zone			
Honey Locust	to zone			

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University of Missouri-Columbia
8 London Hall
Columbia, MO 65211
314-882-2883

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IDENTIFYING AND SELECTING PLANTS FOR THE LANDSCAPE

Writers:
Sherie Rodekohr and Clark Richard Harris
Instructional Materials Laboratory
University of Missouri-Columbia

Consulting Editors:
Richard Linhardt and Jim Riley
Agricultural Education
University of Missouri-Columbia

Editor and Project Coordinator:
Veronica Feilner
Instructional Materials Laboratory
University of Missouri-Columbia
8 London Hall
Columbia, Missouri 65211

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Veronica Feilner, Editor
and Project Coordinator
Instructional Materials Laboratory
University of Missouri-Columbia

Jim Riley and Richard Linhardt
Agricultural Education
University of Missouri-Columbia

FOREWORD

The Introduction to Landscaping advisory committee suggested the that these materials be made available as a reference for use by adults in the class. The plant identification and selection tables were developed based on Missouri conditions.

Those using this publication on an individual basis may want to consult with the local agriculture instructor about additional materials or classes related to horticulture.

Bob R. Stewart, Professor and Coordinator
Agricultural Education
University of Missouri-Columbia

Terry Heiman, Director
Agricultural Education
Department of Elementary and
Secondary Education

IDENTIFYING AND SELECTING PLANTS FOR THE LANDSCAPE

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Table 7 - Perennial Identification

Table 8 - Turfgrass Identification

TABLE 1 - SHADE TREE IDENTIFICATION

Acer rubrum - red maple

Acer saccharum - sugar maple

Betula nigra - river birch

Betula pendula - European white birch

Fraxinus Pennsylvania - green ash

Gleditsia triacanthos inermis - honey locust

Liquidambar styraciflua - sweet gum

Liriodendron tulipifera - tulip tree

Plantanus occidentalis - sycamore

Quercus palustris - pin oak

Tilia cordata - littleleaf linden

Table 1 - Shade Tree Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT	VENATION
Red Maple	*Acer rubrum*	upright to round	ascending	upright-spreading	red to green glabrous stems	terminal--blunt, scaled, clustered; lateral--scales	opposite	palmate
Sugar Maple	*Acer saccharum*	upright, oval	ascending low branches, upright-spreading	dense mass, upright to rounded	slender, brown stems with lenticels	terminal--long, pointed; lateral--1/2 the size of terminal buds	opposite	palmate
River Birch	*Betula nigra*	upright, oval, rounded with maturity	drooping with maturity	open; multiple trunks	pubescent, glabrous; turning reddish	terminal--small, 1/5" long, pubescent; reddish-brown; lateral--very small	alternate	pinnate
European White Birch	*Betula pendula*	oval	graceful, pendulous branches	single or multi-trunk; pyramidal-young	light tan, turning white with irregular, vertical black markings; glabrous	terminal--pointed, curved, brownish-black	alternate	pinnate
Green Ash	*Fraxinus pennsylvanica*	round to oval; irregular with maturity	3-5 main branches; dense, upright, upturned at ends	irregular with age	rounded, stout, glabrous to pubescent; leaf scar looks like a smile; green turning gray	terminal--dark rusty brown; lateral--smaller buds	opposite	pinnate
Honey Locust	*Gleditisia triacanthos inermis*	oval	zig zag stems, strong horizontal branching	open spreading, crown	smooth, reddish-brown zig zag stems	terminal--absent; lateral--small	alternate	pinnate
Sweet Gum	*Liquidambar styracifhia*	oval to irregualar	spreading	dense	corky ridges on dark brown stems	terminal--1/4 to 1/2" long, large, imbricate; reddish-brown; lateral--smaller	alternate	palmate
Tulip Tree	*Liriodendron tulipifera*	oval	high branched, spreading	massive	aromatic when broken; green to reddish brown	terminal--1/2" long, looks like ducks bill; greenish to reddish-brown; lateral--very small	alternate	pinnate

Table 1 - Shade Tree Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE	UNIQUE CHARACTERISTICS
simple; 2-5" long	orbicular, 3-5 lobed	triangular ovate lobes; irregular teeth, v-shaped	acuminate	rounded to cordate	medium green; light green below; new leaves are reddish; red, scarlet in fall	light gray when young; dark gray and rough when mature	smooth; hairy veins below	new growth and petioles often red
simple; 3-6" across	orbicular to broadly obovate, 3-5 lobed	coarsely toothed	acuminate	cordate	medium green; yellow to red in fall	dark gray-brown	smooth	
simple; 1-3" long	ovate	doubly serrate	acute, pointed	cuneate to acute; wedge-shaped	medium green; yellow in fall	beige to reddish brown; exfoliating	impressed veins	
simple; 1 1/4 to 3" long	broad ovate	doubly serrate	acuminate	truncate	glossy green; paler below, yellow in fall	white, marked with dark patches, black with maturity	glabrous	
pinnately compound; 5-9 leaflets, 2-5" long	ovate to oblong, lanceolate	entire, crenate, serrate	acuminate	broad crenate	medium-dark green; paler under, yellow in fall	gray to gray-brown; ridged and furrowed	can be pubescent beneath	choose male or seedless form "Marshall Seedless"
pinnately or bipinnately compound; 6-8" long with alternate leaflets	up to 80 1/2-1" long oblong-lanceolate leaflets	slightly crenate	leaflet-obtuse	leaflet-oblique	dark green; yellow in fall	textured; gray to black	pubescent on midribs	interesting branching habit
simple; 4-7" across	nearly orbicular, 5-7 star shaped leaves	finely serrated lobes	acuminate	cordate	glossy lustrous green; yellow, red, scarlet and purple in fall	gray when yound, deeply furrowed with maturity	smooth	
simple; 3-6" long	nearly orbicular	4 lobes	nearly flat; truncate lobe	rounded to truncate	shiny green; paler below; yellow in fall	ash-gray textured	smooth	

Table 1 - Shade Tree Identification continued

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT	VENATION
Sycamore	*Platanus occidentalis*	oval to irregular	spreading	rounded head with maturity	stout, round, smooth or pubescent, yellow-brown, slightly zig zag; long internodes	terminal--absent; lateral--large, conical, dark brown	alternate	palmate
Pin Oak	*Quercus palustris*	pyramidal	lower branches hang down; upper branches ascend; middle branches are horizontal	dense, central leader	slender; greenish-brown	imbricate, conical, brown, pointed, 1/8" long	alternate	pinnate
Littleleaf Linden	*Tilia cordata*	upright; oval to pyramidal with maturity	dense	pyramidal when young	slender, brown stems	terminal--absent; lateral--long, reddish brown, egg-shaped buds	alternate	palmate

Table 1 - Shade Tree Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE	UNIQUE CHARACTERISTICS
simple; 4-12" across	5-lobed, broad-triangular lobes, ovate to reinform	coarsely toothed	acuminate	cordate	medium green; tan in fall	smooth upper gray, trunk has exfoliating bark in large pieces	pubescent along veins, below	
simple; 3-5" long	elliptical	5-7 deep lobes	acuminate	cuneate	dark green above; lighter beneath with tufts of hair; red or brown in fall; foliage persists into winter	brown to gray with maturity; lightly ridged	smooth	brown leaves remain on tree during the winter
simple; 1 1/2-2" long	orbicular	finely serrate	acuminate	cordate	dark green; yellow to red in fall	brownish-gray, ridged with maturity	glabrous, axillary tufts of brown hairs below	fragrant flowers attract bees

TABLE 2 - FLOWERING TREE IDENTIFICATION

Albizia julibrissim - mimosa

Cercis canadersis - eastern redbud

Cornus florida - flowering dogwood

Crataegus phaenopyrum - Washington hawthorne

Koelreuteria paniculata - golden raintree

Magnolia soulangiana - saucer magnolia

Malus species - flowering crabapple

Pyrus calleryana "Bradford" - Bradford pear

Table 2 - Flowering Tree Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT	VENATION
Mimosa	*Albizia julibrissin*	broad-spreading, vase-shaped	arching	multi-trunk	slender, greenish, glabrous stem with lenticels	terminal--absent; lateral--2-3 small, brown, rounded scales	alternate	pinnate
Eastern Redbud	*Cercis canadensis*	rounded	horizontally ascending	multi-stemmed	dark brown or gray-tan with lenticles; zig zag	terminal--absent; lateral--1/8" long, flattened; sometimes two together	alternate	palmate
Flowering Dogwood	*Cornus florida*	semi-rounded	horizontal layered effect	wide spreading	slender, greenish to purple; pubescent in youth; scar encircles stem	terminal--flower bud at stem apex; flattened, 2 large scales cover it; lateral--small slender buds	opposite	pinnate; parallel to the margins
Washington Hawthorn	*Crataegus phaenopyrum*	oval to round; upright	low branching	multi-trunk; dense	brown slender; with 1-3" long thorn	terminal--larger scales, reddish; lateral--smaller, reddish, globular	alternate	pinnate
Golden Raintree	*Koelreuteria paniculata*	rounded, spreading	spreading and ascending	medium	stout with raised leaf scars; lenticels	terminal--absent; lateral--half elliptical, 2 scales	alernate	pinnate
Saucer Magnolia	*Magnolia soulangiana*	oval to rounded; irregular with maturity	spreading	multi-trunk	brown, glabrous with grayish lenticles; stipular lines encircle stem	terminal--pubescent, silky to the touch, 1/2 to 3/4" long, large, oval; lateral--smaller, short pubescent	alternate	pinnate
Flowering Crabapple	*Malus species*	oval to spreading	upright to spreading	multi-trunk	reddish brown	terminal--oval with scales; pubescent; lateral--oval with scales	alternate	pinnate
Bradford Pear	*Pyrus calleryana "Bradford"*	pyramidal to oval	vertical branching	upright branches	glossy brown	terminal--large wooly oval elongated buds, 1/2" long; lateral--same	alternate	pinnate

Table 2 - Flowering Tree Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE	UNIQUE CHARACTERISTICS
bipinnately compound; 20" long	40-60 leaflets, 1/4-1/2" long	smooth, entire	acute	oblique	medium green; yellow in fall	gray, brown	sometimes pubescent on midribs on underside	interesting flowers; weak-wood
simple 3-5" long	broadly ovate	entire	acuminate	cordate, the petiole is swollen at the blade	dark green; yellow in fall	brownish-black; scales	glabrous to pubescent; glabrous underside	persistent fruit in winter; showy flowers
simple, 3" long	elliptic or ovate	entire-wavy	acuminate	cuneate to rounded	dark green; brilliant in fall, whitish underside	light-gray, textured	glabrous upper surface; glaucous underside; pubescent on veins	winter branching; 4 seasons of interest
simple, 1-3" long	triangular; ovate	3 to 5 sharply serrate lobes	acute	truncate or subcordate	dark green, paler underside; reddish in spring; yellow in fall	light to medium gray	smooth	leaf-like stipules may be present at base of leaf
pinnate or bi-pinnately compound; to 14" long	7-15 oval leaflets; 3" long	coarsely serrate; incisely lobed	acuminate	rounded	green; yellow in fall	light grayish-brown; lightly textured	glabrous; pubescent veins on underside	nice, persistent fruit in winter
simple, 3-6" long	obovate to broad-oblong	entire	acuminate, narrow, abruptly short-pointed	taper-pointed, rounded-cuneate	green; yellow to brown in fall	light gray	finely pubescent upperside and underside	
simple, 2-3" long	ovate to elliptic	serrate to entire	acute	rounded	green to red; yellow to red in fall	grayish-brown	smooth	showy flowers
simple, 1 1/2-2 1/2" long	broad-ovate	crenate	short, acuminate	rounded	glossy green; purple in fall	glossy brown turning gray-brown with maturity	glabrous	good fall color; fruit not important; nice in bloom

TABLE 3 - EVERGREEN TREE IDENTIFICATION

Ilex opaca - American holly

Juniperus virginiana - Eastern red cedar

Magnolia grandiflora - southern magnolia

Picea abies - Norway spruce

Picea pungens "Glauca" - blue spruce

Pinus nigra - Austrian pine

Pinus strobus - white pine

Pinus sylvestris - Scotch pine

Tsuga canadensis - hemlock

Table 3 - Evergreen Tree Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT	VENATION
American Holly	*Ilex opaca*	pyramidal	horizontal branching; low branching	densely open, irregular	slender; black stipules on each side of leaf scar	terminal--short, round, pointed; lateral--same	alternate	pinnate
Eastern Red Cedar	*Juniperus virginiana*	pyramidal to broadly pyramidal	horizontal branching, upward, curved branches	upright, spreading	reddish-brown	not important	whorls of 3	parallel
Southern Magnolia	*Magnolia grandiflora*	pyramidal; rounded in maturity	low branching	dense	green to gray-brown; pubescent	terminal--large, fuzzy; lateral--smaller, fuzzy	alternate	pinnate
Norway Spruce	*Picea abies*	pyramidal	horizontal branches with pendulous branchlets	retains low branches	slender; reddish-brown; glabrous	1/4" rosette shaped, brown buds	spreading around the stem	parallel
Blue Spruce	*Picea pugens "Glauca"*	broadly pyramidal	horizontal branches to ground	dense-compact	stout; orange-brown	conical with blunt tip, yellowish-brown	spreading around stem	parallel
Austrian Pine	*Pinus nigra*	pyramidal; oval in maturity	horizontal branching	dense, compact to open	rough with leaf bases	terminal--oval to oblong or cylindrical, 1/2-1" long with sharp point	spirally arranged clusters	parallel
White Pine	*Pinus strobus*	pyramidal to irregular; pyramidal in maturity	symmetrical; horizontal branching	symmetrical; soft appearance	green to greenish-brown; straight, slender	terminal--1/4" long oval, long pointed buds	spirally arranged clusters	parallel
Scotch Pine	*Pinus sylvestris*	irregular pyramidal	lower branches die with age	wide-spreading, open	green to brown; turning orange with maturity	terminal--oblong-ovate, 1/4-1/2" long	spiralling around stem	parallel
Hemlock	*Tsuga canadensis*	pyramidal	horizontal; pendulous with age to ground		roughened by persistent leaf bases	terminal--minute, oval with hairy scales; lateral--same	spirally arranged	parallel

Table 3 - Evergreen Tree Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE	UNIQUE CHARACTERISTICS
simple; leathery	elliptical to elliptic-lanceolate	flattened with short spines, rarely nearly entire	acuminate, pointed with spin	truncate	dull, yellow-green	light gray, smooth	glossy, smooth	
scale like	awl shaped	pointed	pointed	NA	dull reddish-green	brownish-gray; peels with maturity	glaucous upper-side; green underside	dull reddish color may not contrast with other plants
simple; leathery; 5-10" long	obovate-oblong or elliptic	smooth, entire	obtusely short-acuminate or obtuse	cuneate	shiny dark green; rust colored and pubescent on underside	dark grayish-green	leathery upper-side; pubescent underside	
1/2-1" long squarish needles	straight or curved	smooth	blunt	NA	bright to medium green	reddish-brown; warty	glaucous	branches droop
3/4-1" long squarish needles with 4 angles	auricular, sharp pointed	encurved	pointed	NA	gray to blue-green	orange-brown	glaucous	blue color detracts from other plants
4-6" long sharp, stiff needles; 2 per bundle	straight or curved	minutely toothed	pointed; sharp to touch	leaf sheath present	sharp stiff; dark green	dark brown, furrow; gray mottled ridges	smooth	sticky, resinous sap
3-5" long soft needles; 5 per bundle	acicular, slender, flexible	finely serrate	pointed	leaf sheath usually absent	bluish to gray- green	thin smoother, grayish-brown	smooth	sticky, resinous sap
1 1/2 -3" long needles; 2 per bundle	twisted, stiff	minutely toothed	short pointed	NA	blue-green; yellowish-green in winter	reddish-orange; grayish-red-brown with maturity	glaucous	resinous sap
simple	2 ranked linear, obtuse or acutish, 1/4-2/3" long	minutely serrate	obtuse	rounded	dark green upper side; 2 whitish bands on underside	brownish-red to gray; scaly; deeply furrowed	obscurely grooved	

TABLE 4 - FLOWERING SHRUB IDENTIFICATION

Berberis thunbergii - Japanese barberry

Cornus sericea - redosier dogwood

Chaenomeles speciosa - flowering quince

Euonymus alatus - winged euonymus or burning bush

Forsythia x intermedia - border forsythia

Ligustrum japonicum - wax leaf privet

Nandina domesticum - nandina or heavenly bamboo

Pyracantha coccinea - scarlet firethorn

Salix gracilistyla - rosegold pussy willow

Spirea vanhouttei - Vanhoutte spirea

Syringa vulgaris - common lilac

Table 4 - Flowering Shrub Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT
Japanese Barberry	*Berberis thunbergii*	rounded; dense	multi-stemmed	very dense; broader than tall	slender, dark reddish-brown stems with small thorns at buds	terminal--ovoid, scales; lateral--located at axis of thorn with smaller bud on either side	alternate
Redosier Dogwood	*Cornus sericea*	broad spreading	multi-stemmed	spreads by underground stems; loose	slender, dark red stems with lenticels	terminal--hairy flowering bud sticks out from stem; lateral--vegetative buds are elongated	opposite
Flowering Quince	*Chaenomeles speciosa*	rounded; irregular	stiff branches; twiggy	open	slender, light brown spines	terminal--rounded, scaly; lateral--small conical, scaly	alternate
Winged Euonymus or Burning Bush	*Euonymos alatus*	upright; flat top; rounded	dense; upright	multi-stemmed	light brown with corky ridges	terminal--small with 4-6 scales conical, oval, acute, glabrous; lateral--same	opposite to subopposite
Border Forsythia	*Forsythia x intermedia*	rounded with arching branches	arching, upright, spreading	normal density	4-sided, yellowish brown stems with lines down stem and lenticels	lateral--vegetative and flowering, long, pointed, clustered at the nodes	opposite
Wax Leaf Privet	*Ligustreum japonicum*	upright to spreading round	upright to spreading	multi-stemmed	buds and stems at nearly right angles to branchlets; hairy, slender	lateral--small conical, scaly	opposite
Nandina Heavenly Bamboo	*Nandina domestica*	upright, irregular	unbranched stems; strongly vertical	spread by rhizomes	upright, rough dark brown bark with vertical lines	not applicable	alternate
Scarlet Firethorn	*Pyracantha coccinea*	upright; rounded; irregular	stiff; upright	open if unpruned	glossy brown with thorns	terminal--small; lateral--same	alternate
Rosegold Pussy Willow	*Salix gracilistyla*	rounded	low branching	broad	rather slender, light yellow-green stems	terminal--absent; lateral--1/5" oblong, rounded at apex; pubescent; flattened against stem	alternate
Vanhoutte Spirea	*Spirea vanhouttei*	rounded with pendulous branches	ascending branches arching to ground	dense; compact	slender, brown, rounded, glabrous stems	terminal--small; lateral--small	alternate
Common Lilac	*Syringa vulgaris*	upright, irregular; multi-stemmed; leggy	upright leggy, spreading	upright	leaf scars not connected by stipular lines; stout	terminal--large dual; lateral--angular with scales in pairs	opposite

Table 4 - Flowering Shrub Identification continued

VENATION	TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE
pinnate	1/2-1 1/2" long; simple in clusters	obovate to spatulate	entire	rounded	oblique	medium green; reddish in fall	brown	glabrous upperside; glaucous underside
pinnate	2-5" long; simple	ovate to broad; ovate	entire	acuminate	rounded	medium-green; purplish in fall	red in winter	glaucous underside
pinnate	simple	ovate to oblong; 1-3" long	sharply serrate	acute	acute	glossy, dark green; yellow in fall	dark grayish-brown	lustrous
pinnate	simple; 1-2" long	elliptic to obovate	finely serrate	acuminate, acute	cuneate	dark green; brilliant red in fall	green when young; turning gray with age	smooth
pinnate	3-5" long; simple	narrowly ovate-elliptic	dentate in upper part of leaf, entire on bottom half	acute	cuneate	medium green; bronze in fall	yellowish brown	smooth
pinnate	simple; 1-2 1/2" long	elliptic-oblong, ovate	entire	acute	cuneate	glossy, dark green	medium gray, smooth	pubescent underside
pinnate	2-3 times compound; up to 30' long	leaflets--ovate; 1-2" long; 1/2-1" wide	entire	acute	acute	medium green; bright red in fall	rough dark brown with vertical lines	smooth
pinnate	simple; 1-1 1/4" long	narrow elliptic to lanceolate	lightly serrate-crenate	acute	cuneate	glossy, dark green	dark brown	smooth
pinnate	simple; 1 1/2-4" long	lanceolate	serrate	acuminate, pointed	cuneate	bluish-gray	ridged and furrowed	glaucous and silky underside
pinnate	simple	ovate to obovate; 3/4-1 1/2" long	toothed often obscurely; 3-lobed	pointed	tapering rounded	pale bluish-green; lighter underside; bronze-yellow in fall	dark grayish-brown; shreds on older wood	glabrous
pinnate	2-5" long; simple	ovate to broad; ovate	entire	acuminate	cordate	dark green, no fall color	dark gray to gray-brown	glabrous

TABLE 5 - EVERGREEN SHRUB IDENTIFICATION

Buxus microphylla - Korean boxwood littleleaf boxwood

Euonymus kiautschovicus - spreading euonymus

Ilex crenata "Helleri" - Japanese holly

Juniperus chinensis "Hetzii" - hetzii juniper

Juniperus chinensis "Phitzeriana" - phitzer juniper

Mahonia aquifolium - Oregon grape holly

Pinus mugo - mugo pine

Rhododendron catawbiense - catawba rhododendron

Taxus cuspidata - Japanese yew

Thuja occidentalis - Eastern or American arborvitae or white cedar

Viburnum rhytidophullum - leatherleaf viburnum

Table 5 - Evergreen Shrub Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	BUDS	LEAF ARRANGEMENT
Korean Boxwood or Littleleaf Boxwood	*Buxus microphylla*	compact; rounded	dense	compact; spreading	slender; green	terminal--small, ovoid	opposite
Spreading Euonymus	*Euonymus kiautschovica*	broadly oval	broad spreading	multi-stemmed; will climb like a vine	slender, green, rounded	terminal--conical, sharp-pointed; greenish, tinged with red in winter	opposite
Japanese Holly	*Ilex crenata "Helleri"*	compact; dense; rounded	multi-branched; twiggy	dense, compact	slender green	terminal--small, inconspicuous; lateral--small	alternate
Hetzli Juniper	*Juniperous chinensis "Hetzii"*	spreading	45° branch angle	dense-compact; irregular; spreading	stout, ragged bark	terminal--small	cross arrange-ment when viewed from end of twig
Pfitzer Juniper	*Juniperus chinensis "Pfitzeriana"*	wide spreading	pendulous at tip; horizontal branching	dense, compact	stout; ragged bark	terminal--small	cross arrange-ment when viewed from end of twig
Oregon Grape Holly	*Mahonia aquifolium*	upright; irregular	upright	irregular, open, straggly habit	roundish, stout; leaf scars--narrow, low, half encircling the stem	terminal--large, oval shape with 6 scales; lateral--small	alternate
Mugo Pine	*Pinus mugo*	mounded	broad spreading, bushy	spreading	short without down turning; brown to blackish-brown	terminal--1-4 to 1/2" oblong bud with reddish-brown scales, encrusted with resin;	2 in a bundle, may last for 5 years
Catawba Rhododendron	*Rhododendron catawbiense*	rounded	low to ground	taller than wide	brown with age	terminal--large flower buds; lateral--large 1/2" long, scaly, pointed, yellowish-green	alternate
Japanese Yew	*Taxus · cuspidata*	broad oval; compact; irregular	upright-spreading	dense-compact; irregular; spreading	green turning reddish-brown	terminal--ovoid, oblong; lateral--oval to oblong, chestnut brown, overlapping	spirally arranged
Eastern or American Arborvitae; White Cedar	*Thuja occidentalis*	pyramidal	short ascending branches to ground	upright; horizontal sprays	alternate, compressed, flat stems	not important	overlapping scales
Leatherleaf Viburnum	*Viburnum rhytidophyllum*	upright; oval to rounded	loosely branched; upright	upright; strongly multi-stemmed	gray to brown with pubescence; older stems become glabrous	terminal--large 1/2" oblong, fuzzy buds; lateral--large, rusty-colored, vegetative buds; 1 1/2-2" flowering buds	opposite

Table 5 - Evergreen Shrub Identification continued

VENATION	TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	BARK CHARACTERISTICS	LEAF SURFACE
pinnate	simple; 1/2-1" long	obovate	entire	rounded	cuneate	green; yellow to brownish-yellow in winter	light tan	smooth
pinnate	simple; 2-3" long	broad-elliptic or obovate	crenate-serrate	acute to obtuse	cuneate	green; rusty-green in winter	green stems with age; changing to gray-brown	smooth
pinnate	simple; 1/2-1 1/4" long	obovate to oblong	crenate-serrate	obtuse	acute to broad-cuneate	dark green	green young stems maturing to yellow-brown	glabrous
not important	needle and awl	scale-like; a few awl-shaped	smooth	pointed	rounded	blue-green	dark brown, splitting, peeling	glaucous
not important	scale and awl-like	juvenile–awl-shaped; adult–scale-like, obtuse, thickened	smooth	pointed	rounded	gray-green	dark brown; splitting, peeling	glaucous
pinnate	compound; 5-9 leaflets; 6-10" long	ovate to oblong-ovate	sinuately spiny-dentate	acute	rounded-truncate	dark green; holly-like; purplish-bronze in fall	light brown	smooth/shiny; stiff
parallel	in pairs of 2; 2" long	rigid, curved	finely toothed	short, blunt, horny point	rounded	medium green	brown	stomatic lines on both surfaces
pinnate	simple; 2-5" long	elliptic to oblong	entire, smooth	obtuse, cuspidate	rounded	dark green; yellow-green underside	rusty	glabrous; leathery
parallel	needle; 1" long	linear; usually 2 ranked	entire	cuspidate	rounded	dark green; yellowish underside	reddish-brown	smooth
not important	scale-like, abruptly pointed on main axis; glandular	scale-like; pointed	not important	pointed	rounded	dark green; brownish-yellow in winter	reddish- to grayish-brown	scaly
pinnate	simple; 2-8" long	ovate-oblong to ovate-lanceolate	entire	acute or obtuse	rounded or subcordate	dark green; light to white on underside	medium grayish- brown	glabrous; strongly wrinkled upperside; leathery

TABLE 6 - GROUND COVER AND VINE IDENTIFICATION

Ajuga reptans - ajuga or bugleweed

Celastrus scandens - American bittersweet

Coronilla varis - crown vetch

Euonymus fortunei radicans - bigleaf wintercreeper

Hedra helix - English ivy

Juniperus horizontalis - creeping juniper

Lonicera japonica Halliana' - Hall's honeysuckle

Vinca minor - creeping myrtle or periwinkle

Table 6 - Ground Cover and Vine Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	LEAF ARRANGEMENT	VENATION
Ajuga or Bugleweed	*Ajuga reptans*	irregular	grows in a clump	mat-like ground cover	roots form along stems; square flower stems	opposite	pinnate
American Bittersweet	*Celastrus scandens*	irregular	spreading	twining vine; woody vine	not important	alternate	pinnate
Crown Vetch	*Coronilla varis*	sprawling	prostrate or ascending stems	vine-like herb	brown in winter; green in growing season	leaflets opposite	pinnate
Bigleaf Wintercreeper	*Euonymus fortunei 'Radicans'*	irregular	irregular; erect, dense branches	trailing or climbing evergreen vine	green-purple, gray with age	opposite	pinnate
English Ivy	*Hedra helix*	irregular	spreading	trailing on the ground or climbing by aerial rootlets; woody vine	reddish	alternate	pinnate
Creeping Juniper	*Juniperus horizontalis*	prostrate	semi-upright or low irregular spreading	erect trailing habit	not important	flattened close to stem, overlapping	NA
Hall's Honeysuckle	*Lonicera japonica 'Halliana'*	irregular	spreading	climbing; woody vine	slender, hairy	opposite	pinnate
Creeping Myrtle or Periwinkle	*Vinca minor*	mat-forming	irregular	trailing	slender, arching, drooping green	opposite	pinnate

Table 6 - Ground Cover and Vine Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	LEAF SURFACE	UNIQUE CHARACTERISTICS
simple	basal--oblong, elliptic or ovate; upper--elliptic or ovate	entire wavy or blunt serrate	rounded	narrowed to petiole	shiny green, burgundy	smooth	NA
simple	elliptic to obovate, 1 3/4" to 4 1/2" long, up to 2 1/4" wide	toothed, lightly serrate	acute	rounded	bright yellow in fall	smooth	NA
compound	leaflet--oblong to obovate, 1/2" long	entire	rounded	rounded	gray-green	smooth	NA
simple	1 1/2" to 2" long, elliptical; 1/2 to 1 1/2 " wide	wavy, smooth to slightly crenate or serrate	acute	cuneate	dark green	smooth shiny	aerial roots; large terminal buds with sharp points
simple	juvenile--3-5 lobes, 2-5" diameter; mature--less lobed	lobed	acute	rounded	mature--deep green upper-side yellow-green under-side; young--light green	pubescent on underside	NA
needle-like	scale-like and awl-like	NA	pointed	rounded	blue-green to greenish; purple in winter	NA	NA
simple	ovate to oblong, 1 1/2" to 3" long	smooth	acuminate	rounded	dark green	hairy on both sides	NA
simple	1/2" to 1 1/2 " long; 1/2" wide; elliptic to lanceolate	entire	acute	acute	blue-green	glossy, wavy upper surface	NA

TABLE 7 - PERENNIAL IDENTIFICATION

Artemisia schmidtiana - silver mound

Astilbe x ardendsii - false spirea astilbe

Aquilegia hybrids - columbine

Chrysanthemum x morifolium - garden mum

Coreopsis lanceolata - coreopsis

Hemerocallis hybrids - day lily

Heuchera sanguinea - coral bells

Hosta species - plantain lily or hosta

Liriope spicata - creeping lily turf

Phlox subulata - creeping phlox

Table 7 - Perennial Identification

COMMON NAME	BOTANICAL NAME	FORM	BRANCHING HABIT	GROWTH HABIT	STEM	LEAF ARRANGEMENT	VENATION
Silver Mound	*Artemisia schmidtiana*	rounded mound	upright	rounded mound		alternate	palmate
False Spirea Astilbe	*Astilbe x ardendsii*	erect	upright	rounded habit with spiked flowers		whorled	pinnate
Columbine	*Aquilegia hybrids*	erect stems	erect	several stems rising from a thickened root stock; flowers rise above foliage		whorled	palmate
Garden Mum	*Chrysanthemum x morifolium*	columnar to round mound	rounded; erect stems	rounded habit		alternate	pinnate
Coreopsis	*Coreopsis lanceolata*	irregular, upright, sprawling	upright, sprawling	upright, sprawling		opposite	pinnate
Day Lily	*Hemerocallis hybrids*	rounded with upright flower stalks	upright, arching branches	mound-like shape of foliage	NA	grow from a clump at base	parallel
Coral Bells	*Heuchera sanguinea*	rounded clump with upright flower stalks	upright	rounded clump	hairy; reddish color	grow from the root stalk	palmate
Plantain Lily or Hosta	*Hosta species*	rounded mound	upright	upright, arching leaves; spike flowers	NA	grow from clump at base	parallel
Lily Turf	*Liriope spicata*	dense grass-like mat or clump	upright, arching	upright, arching; forming a dense mound	no aboveground stem showing	grow from clump at base	parallel
Creeping Phlox	*Phlox subulata*	prostrate mound, dense	irregular	mat forming		opposite in pairs or alternate; crowded	pinnate

Table 7 - Perennial Identification continued

TYPE OF LEAF	LEAF SHAPE	MARGIN SHAPE	TIP SHAPE	BASE SHAPE	LEAF COLOR	LEAF SURFACE	UNIQUE CHARACTERISTICS
compound twice palmately divided into linear segments	1 3/4" long, linear	smooth	acute	narrowing into petiole	silvery-white	silvery-white; hairs; velvety texture	NA
simple or twice or thrice compound	leaflets--ovate to oblong	doubly serrate	acute	rounded	dark green or bronze	smooth	NA
twice or thrice compound	leaflet--wedge shaped to nearly round	notched	deeply incised	cuneate	yellow-green	smooth	NA
lower--pinnate compound; upper--simple	upper--lanceolate to ovate, 3" long or smaller	upper--lobed 1/3 to 1/2 depth of blade; lobes entire or coarsely toothed	acute	rounded	upper surface--green to gray; underside--gray-green	underside pubescent	strongly aromatic
compound	needle-like	smooth	pointed		dark green	smooth	
simple	strap-like, linear, sword shape	smooth	grass-like, pointed	narrows toward basal clump	bright green	smooth	NA
simple	reniform	lobed serrate	round	rounded	dark, bright green; some with silver markings	hairy	NA
simple	varies with species	smooth to wavy	acuminate	forms tube-shaped stalk; narrows towards basal clump	NA	smooth	flower stalks have bell-shaped flowers
simple	linear, wide, 8" to 20" long; 1/4" wide	minutely serrate	acute	narrows towards basal clump	NA	smooth	NA
simple	linear subulate up to 1" long; needle-like	ciliate	pointed	narrowing to stem	dark green	smooth	stiff leaves, close together

TABLE 8 - TURFGRASS IDENTIFICATION

Cynodon dactylon - Bermudagrass

Festuca arundinacea - tall fescue

Festuca rubra - red fescue

Lolium perenne - perennial ryegrass

Poa pratensis - Kentucky bluegrass

Zoyzia japonica - zoysia grass

Table 8 - Turfgrass Identification

COMMON NAME	BOTANICAL NAME	PICTURE	GROWTH HABIT	TEXTURE	COLOR	NATURAL HEIGHT
Bermudagrass	*Cynodon dactylon*		stolons and rhizomes	fine	dark blue-green	12"
Tall Fescue	*Festuca arundinacea*		rhizomes and stolons	medium to coarse,; forms clumps	medium green	24-36"
Red Fescue	*Festuca rubra*		bunch	fine	dark green	8"
Perennial Ryegrass	*Lolium perenne*		bunch	medium to coarse	dark green	20"
Kentucky Bluegrass	*Poa pratensis*		rhizomes and tillers	medium	blue-green	12-24"
Zoysia Grass	*Zoysia japonica*		stolons and short rhizomes	fine	dark green	12"

Table 8 - Turfgrass Identification continued

BUD LEAF ARRANGEMENT	BLADE TIP	BLADE	COLLAR	AURICLE	LIQULE	SHEATH	INFLORESCENSE
folded	sharply pointed to the tip	flat or folded	narrow with hairs on the edge	absent	fringe of hairs fused at the base	slightly flat with tufts of hair at the base of plant; upper– rounded, smooth, overlapping	spike
rolled	parallel-sided	flat, ridged above and wide, edges rough	hairy, broad	blunt to absent with hairs on margin	indistinct, blunt	round, smooth, split	racemic
folded	pointed and needle-like	flat with thick midrib, thick	indistinct and narrow	absent	indistinct truncate, smooth, entire	round, smooth, split	racemic
folded	flat keeled below, glossy on bottom	pointed; tapering to tip	broad and distinct	large claw-like	membranous, entire; may be toothed, rounded to acute	open, flat, almost round, smooth	spike
folded	boat-shaped and smooth	v-shaped, reeled, bottom smooth	medium w/slight hairs	absent	membranous, long truncate, entire, smooth	smooth, split	panicle
rolled	short and pointed	flat, scattered with long hairs	indistinct with hairy margins	absent	fringe of hairs	round, smooth with hairs at top, split	spike

SELECTING PLANTS FOR THE LANDSCAPE

Table 9 - Shade Tree Selection

Table 10 - Flowering Tree Selection

Table 11 - Evergreen Tree Selection

Table 12 - Flowering Shrub Selection

Table 13 - Evergreen Shrub Selection

Table 14 - Ground Cover and Vine Selection

Table 15 - Perennial Selection

Table 16 - Turfgrass Selection

TABLE 9 - SHADE TREE SELECTION

Acer rubrum - red maple

Acer saccharum - sugar maple

Betula nigra - river birch

Betula pendula - European white birch

Fraxinus Pennsylvania - green ash

Gleditsia triacanthos inermis - honey locust

Liquidambar styraciflua - sweet gum

Liriodendron tulipifera - tulip tree

Plantanus occidentalis - sycamore

Quercus palustris - pin oak

Tilia cordata - littleleaf linden

Table 9 - Shade Tree Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	TEXTURE
Red Maple	*Acer rubrum*	40-60'	25-50'	upright to round	medium to fast; space 30' apart	3	specimen; street; patio; downtown	medium
Sugar Maple	*Acer saccharum*	40-70'	50-60'	upright, oval	slow to medium; space 30' apart	3	specimen; street, residential or larger	medium
River Birch	*Betula nigra*	30-50'	30-50'	upright, oval; rounded with maturity	medium to fast; space 30' apart	4	specimen; residential or larger effect; groupings	medium to fine
European White Birch	*Betula pendula*	25-40'	10-15'	oval, graceful, pendulous branches	medium; space 12' apart	8	good for narrow spaces; residential or larger; specimen	fine
Green Ash	*Fraxinus pennsylvanica*	50-60'	40-50'	round to oval; irregular with maturity	fast; space 40' apart	3	street, quick effect	medium, coarse
Honey Locust	*Gleditsia triacanthos inermis*	30-60'	30-50'	oval	medium to fast; space 30' apart	4	street; raised planters; thornless & fruitless varieties are good for downtown areas & lawn trees	coarse, winter pattern
Sweet Gum	*Liquidambar styraciflua*	60-70'	30-40'	oval to irregular	slow to medium; space 30' apart	5	specimen; street, residential or larger	medium to coarse
Tulip Tree	*Liriodendron tulipifera*	60-90'	30-50'	oval, pyramidal	fast; space 40' apart	4	large scale design	medium to coarse
Sycamore	*Platanus occidentialis*	70-100'	70-100'	oval to irregular	fast; space 40' apart	4	large scale; parks and large estates	coarse
Pin Oak	*Quercus palustris*	60-70'	40-50'	pyramidal; lower branches hang down	medium; space 40' apart	4	residential or larger; specimen; useful urban tree	medium to slightly coarse
Littleleaf Linden	*Tilia cordata*	40-60'	35-40'	upright; oval to pyramidal with maturity	medium; space 30' apart	3	dense shade; street; residential or larger	medium

Table 9 - Shade Tree Selection continued

COLOR (LEAF)	FLOWERING COLOR, LENGTH OF BLOOM	FRUITING TIME/TYPE	FERTILIZER REQUIREMENTS	SOIL CONDITIONS	WATER REQUIREMENTS	LIGHT REQUIREMENTS
medium green; yellow to red in fall	small red colorful flowers in spring	bright red; samaras in late spring	medium	slightly acidic; chlorotic in highly alkaline soils	dry to wet	sun to part shade
dark green; yellow to red in fall	yellow flowers in May	greenish-yellow, Samara; early April; semi-attractive	medium	prefers acidic soil; well-drained	medium to moist	sun to part shade
medium green; yellow in fall	long pistillate	small nutlet	medium	slightly acidic; tolerates many	wet to dry; first to show moisture stress	sun to part shade
glossy green; paler underside; yellow in fall	not important	brown cone-like in summer	medium	medium drainage	high moisture	sun
medium to dark green; paler underside; yellow in fall	not important	2"; light tan samara in clusters in early fall	medium	wide range; acidic to alkaline	dry to wet; drought resistant	sun
bright green; yellow in fall	not important; greenish pea-like; fragrant	fruiting varieties have 8-18" long twisted brown pods, which persist into winter		wide range; acidic to alkaline	dry to wet; drought tolerant	sun to part shade
medium green; yellow, red, or scarlet in fall	not important	brown spiny balls that persist into winter	subject to chlorosis in high alkaline soil	wide range, acidic to alkaline; best in rich clay or loam	dry to wet	sun to shade
shiny green; yellow in fall	large yellow-orange tulip-like flowers in early summer	cone-like fruits that persist into winter	medium	well-drained; perfers acidic soils	medium	sun
medium green; tan in fall	not important	brown 1 1/2" balls that persist into winter	medium	prefers deep rich soil, but will tolerate many soils including alkaline	moist	sun to part shade
dark green; red or brown in fall; foliage persists into winter	not important	light brown (acorn) nut; single or cluster; 1/2" long	subject to iron chlorosis	does not tolerate alkaline soils	prefers moist, but will tolerate dry soils	sun to part shade
dark green; yellow in fall	very fragrant yellow to white flowers in late June	seeds on ribbon-like leaf		wide range of soil; will tolerate alkaline soil if moist; tolerates poor soil	prefers moisture; not tolerant of drought	sun to part shade

Table 9 - Shade Tree Selection continued

COMMON NAME	TEMPERATURE REQUIREMENTS	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	SPECIAL CONSIDERATIONS	UNIQUE CHARACTERISTICS
Red Maple	tolerates city heat and glare	easy; B & B and bareroot; spring		leaf hoppers	not important	good replacement for Silver Maple	colorful fall color
Sugar Maple	to zone	easy; B & B	leaf scorch; verticillium wilt		not important	not good in containers or in pollution; attractive winter branching	colorful fall color
River Birch	to zone	easy	mildew; woody decay; leaf spot; dieback	leaf miner; bronze birch borer; aphids	not important	light shade	showy peeling bark; good winter branch habit
European White Birch	to zone	easy in spring	none serious	bronze birch borers; aphids; leaf miner	summer or fall; spring pruning causes bleeding	litter problem; not recommended because of bronze birch borer	especially interesting white bark
Green Ash	to zone	easy	rusts and cankers; many others	borers and scale; many others	in fall	roots clog drains; wildlife food; somewhat tolerates salt	"Marshall Seedless" variety has no seeds; others create litter
Honey Locust	to zone	easy	leaf spot; cankers; rust	borers; webworm; spider mites	thin young trees of new growth; prune in fall	tends to be overused; salt, pollution, and wind tolerant; low maintenance of leaf drop	interesting branch habit; filtered shade allows grass to grow; thornless cultivars are recommended
Sweet Gum	to zone	B & B in spring; difficult	bleeding necrosis; leaf spots	webworm; scales	not important	seed balls cause litter; not good in city	colorful fall color; seed balls give winter interest
Tulip Tree	to zone	B & B; spring	leaf spot; sooty mold; canker	aphids	not important	roots can be invasive; not tolerant of air pollution; weak-wooded; flowers are high in the tree	massive stately tree
Sycamore	to zone	easy	anthracnose; witches broom; leaf spots	aphids; scale bug; sycamore plant tussock moth	not important	don't use as street tree--too messy; use London Plane tree instead, because it is anthracnose resistant	exfoliating bark; colorful winter trunk, branches, and hanging balls; attractive flaking bark
Pin Oak	to zone	easy	galls; iron chlorosis	none serious	low branches frequently require pruning	winter foliage blocks sun heat; don't use near streets or sidewalks due to low branches	good for city conditions; interesting growth habit
Littleleaf Linden	tolerates heat	easy	leaf blight; cankers; powdery mildew	aphids; scales; linden mite; borers	can be pruned to hedge	pollution tolerant	fragrant flowers attract bees

TABLE 10 - FLOWERING TREE SELECTION

Albizia julibrissim - mimosa

Cercis canadersis - eastern redbud

Cornus florida - flowering dogwood

Crataegus phaenopyrum - Washington hawthorne

Koelreuteria paniculata - golden raintree

Magnolia soulangiana - saucer magnolia

Malus species - flowering crabapple

Pyrus calleryana "Bradford" - Bradford pear

Table 10 - Flowering Tree Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	COLOR (LEAF)
Mimosa	*Albizia julibrissin*	25-35'	25-35'	broad-spreading, vase shape	medium	6	residential; not much value	medium green; yellow in fall
Eastern Redbud	*Cercis canadensis*	20-25'	15-20'	rounded	medium; space 15' apart	4	specimen; under-story; shrub border; groupings	dark green; yellow in fall
Flowering Dogwood	*Cornus florida*	20-30'	15-20'	semi-rounded	slow to medium; space 12' apart	4	specimen; under-story residential; naturalistic; grouping	dark green; brilliant red in fall
Washington Hawthorn	*Crataegus phaenopyrum*	25'	15-20'	oval to round; upright	medium; space 10' apart	4	specimen; mass barrier; accent	dark green; reddish in spring; yellow in fall
Golden Raintree	*Koelreuteria paniculata*	20-40'	20-25'	rounded, spreading	medium; space 20' apart	5	residential; patio/terrace; street tree	green; yellow in fall
Saucer Magnolia	*Magnolia soulangiana*	20-25'	15-20'	oval to rounded; irregular with maturity	medium; space 12' apart	5	specimen	green; yellow to brown in fall
Flowering Crabapple	*Malus species*	15-25'	20-25'	oval to spreading	medium; space 15' apart	4	specimen; naturalistic; grouping; residential or larger	green to red; yellow to red in fall
Bradford Pear	*Pyrus calleryana "Bradford"*	30-50'	20-35'	pyramidal to oval	medium; space 20' apart	4	specimen; street; residential scale	glossy green; purple in fall

Table 10 - Flowering Tree Selection continued

FLOWERING COLOR, LENGTH OF BLOOM	FRUITING TIME/TYPE	TEXTURE CHARACTERISTICS	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TEMPERATURE REQUIREMENTS
showy pink powder puffs in summer	not important	fine	well-drained, alkaline soil	medium	medium	full sun	heat tolerant
pink flowers in early spring before leaves	3" brown pods in fall that persist into winter; legume	medium to coarse	wide range; well-drained, acidic to alkaline soils	moist to drought resistant	medium	sun to part shade; blooms best in full sun	to zone
white or pink showy flowers in mid-May	orange to red fruit in clusters, persist into winter	medium	well-drained acidic soil; add organic matter	medium	medium	part shade to shade	to zone
white 1/2" flowers in mid-June	red-orange clusters in fall that persist into winter	fine-medium	wide range, well-drained, acid to alkaline	dry to moist	medium	sun to part shade	to zone
showy bright yellow panicles in summer	clusters of papery capsules that persist into winter	medium	wide range	drought resistant	medium	best in sun	tolerates low winter temperature and wind
showy, pink to white saucer-shaped flowers	not important	medium-coarse	slightly acidic, loose	medium	medium	sun to part shade	protected location helps prevent flower bud frost damage
white to red flowers in early spring	yellow or red pome fruit in late summer and fall	medium	well-drained slightly acidic soil	medium	medium	sun to part shade	to zone
white flowers in early spring before leaves	small 1/2" fruits in fall; not showy	medium	wide range	medium to dry	medium	sun	to zone

Table 10 - Flowering Tree Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	SPECIAL CONSIDERATIONS	UNIQUE CHARACTERISTICS	OTHER COMMENTS
Mimosa	difficult	vascular wilt	webworm	prune wide-spreading branches to relieve weight	not a quality landscape plant; winter kills	foliage folds at night; showy flowers	not suited to northern climates; short life span
Eastern Redbud	medium; B & B	canker; leaf spot; verticillium	borers; scales; leaf hoppers; leaf rollers	prune dead branches	better related to cool, moist climate	persistant fruit in winter; showy flowers	blooms same time as dogwood
Flowering Dogwood	B & B; difficult	fungal wilt; leaf spot	borers	not applicable	subject to winter injury to flower buds	interesting winter branching; 4 seasons of interest	grows wild in Southern Missouri and south; Missouri's state tree; wildlife food
Washington Hawthorn	easy; B & B, early spring, as small tree	cedar Hawthorn rust; fire blight; leaf spots; powdery mildew; scab	lace bug; aphids; borers	winter or early spring	tolerates city conditions	2" thorns	none applicable
Golden Raintree	easy; B & B	none serious	none serious	winter	none important	nice persistant fruit in winter	tolerates air pollution
Saucer Magnolia	difficult, B & B in spring	black mildew; leaf spots; leaf blight	none serious	prune after flowering	blooms best in sun	showy flowers	susceptible to late frost damage
Flowering Crabapple	easy	fire blight; cedar apple rust; apple scab; canker; powdery mildew	scale; borers; aphid	prune after flowering	blooms best in sun	showy flowers	can grown in espalier or raised planter; many varieties
Bradford Pear	easy; B & B in early spring	none serious	none serious	prune lower branches for down-town walk; spring	tolerates pollution	good fall color; fruit not important; nice in bloom	fairly resistant to fire blight

TABLE 11 - EVERGREEN TREE SELECTION

Ilex opaca - American holly

Juniperus virginiana - Eastern red cedar

Magnolia grandiflora - southern magnolia

Picea abies - Norway spruce

Picea pungens "Glauca" - blue spruce

Pinus nigra - Austrian pine

Pinus strobus - white pine

Pinus sylvestris - Scotch pine

Tsuga canadensis - hemlock

Table 11 - Evergreen Tree Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	COLOR (LEAF)
American Holly	*Ilex opaca*	15-30'	15-20'	pyramidal	slow to medium; space 20' apart	5	specimen; screen; grouping	dull yellow-green
Eastern Red Cedar	*Juniperus virginiana*	30-40'	15-18'	pyramidal to broadly pyramidal	medium; space 12' apart	2	enframement; screen; windbreak; hedge	dull reddish-green
Southern Magnolia	*Magnolia grandiflora*	50-60'	30-40'	pyramidal; rounded in maturity	slow to medium; space 35' apart	7	specimen; large scale; high screen	shiny, dark green; rust colored and pubescent on underside
Norway Spruce	*Picea abies*	40-60'	25-35'	pyramidal	medium; space 25' apart	2	specimen; windbreak; enclosure	bright to medium green
Blue Spruce	*Picea pungens "Glauca"*	80-100'	15-25'	broadly pyramidal	slow to medium	2	specimen; accent; windbreak	gray to blue-green
Austrian Pine	*Pinus nigra*	30-60'	20-40'	pyramidal; oval in maturity	medium	4	specimen; wind-break; screen or grouping	dark green
White Pine	*Pinus strobus*	50-60'	25-30'	pyramidal to irregular; pyramidal in maturity	fast to medium; space 15' apart	3	specimen; screen; mass; background; residential and large scale	bluish to gray-green
Scotch Pine	*Pinus sylvestris*	30-60'	30-40'	irregular pyramidal	medium; slow with maturity; space 25' apart	2	specimen; mass; windbreak; screen	blue-green; yellowish-green in winter
Hemlock	*Tsuga canadensis*	50-70'	20-25'	pyramidal	moderate to rapid; grows fast after established; space 10' apart; closer in hedges	3	tall screen & hedges; specimen; open area or understory tree; north exposure; deep shade	dark green; flat needles

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Table 11 - Evergreen Tree Selection continued

FLOWERING COLOR, LENGTH OF BLOOM	FRUITING TIME/TYPE	TEXTURE	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TEMPERATURE REQUIREMENTS
not important	red berries in October that persist into winter	medium-coarse	fertile, well-drained, acidic	moist to dry	medium	sun to part shade	needs wind protection
not important	bluish-gray berry on female plant	medium	wide range; acidic to extremely alkaline; will tolerate poor soils	dry to moist	low	sun	to zone
large, fragrant white flowers in late spring	grayish-brown cone with red seeds in early fall	coarse	wide range, but prefers slightly acidic	medium to moist; not dry	medium	sun to part shade	protect against wind and extreme cold temperatures
not important	brown cones 5-6" in upper part of tree; pendulous	medium	don't plant on poor sites; sandy, well-drained	moist, humid	good fertility	sun to part shade	not tolerant of hot weather
not important	pendulous, cylindrical brown cone	medium	rich moist	medium; some drought tolerance	medium to high	sun	to zone
not important	cones; 3" long; some in clusters	medium	tolerant of poorly drained and heavy soils	tolerates moist, not wet soil; tolerates some drought	medium	sun	heat resistant
not important	5-6" brown cone; pendant	fine	well-drained; tolerates dry, rocky soil	medium to high	medium	sun	to zone
not important	gray to dull brown rounded cones	medium	well-drained; will tolerate poor dry soil; will tolerate acid soil	low to medium	low to medium	sun	to zone
NA	brown 1/2" cone in fall; slender apex nearly blunt	fine	well-drained; acidic; deep moist loam; rocky bluff or sandy	medium to high; not drought tolerant	medium	sun to part shade; grows best in partial shade	not tolerant of dry winds or prolonged heat

Table 11 - Evergreen Tree Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	SPECIAL CONSIDERATIONS	UNIQUE CHAR-ACTERISTICS	OTHER COMMENTS
American Holly	easy; B & B in spring	leaf spot; bacterial blight; twig die back; leaf rot	scale; holly leaf miner; bud moth; whitefly; berry midge	winter holiday season	smaller leaf varieties are better for home and downtown	broadleaf evergreen; spiny leaves	tolerates air pollution; plant 1 male for every 2-3 females
Eastern Red Cedar	easy; B & B	cedar apple rust	bag worms; spider mites	withstands heavy pruning; hedges	very easy to grow; may clash with other foliage colors	narrowleaf evergreen; resistant to phomopsis	tolerates air pollution
Southern Magnolia	difficult; B & B; early spring	none serious	none serious	after flowering	lower branches will help hide dropping leaves	broadleaf evergreen	protect from winter winds and sun
Norway Spruce	easy; B & B	none serious	spider mites; spruce gall-aphids; borers; budworm	tolerates heavy pruning; spring	NA	narrowleaf evergreen; branches droop	much over-planted
Blue Spruce	easy; B & B	none serious	spruce gall-aphids; spruce budworm; spider mites	NA	looses lower branches	narrowleaf evergreen; blue color will detract from other plants	over-used
Austrian Pine	easy	Diplodia tip blight	pine needle; scale	none required; prune candles to shape	tolerates salt and city conditions	narrowleaf evergreen	more tolerant than other pines
White Pine	easy	white pine blister rust	white pine weevil	can be a sheared hedge; prune candles to shape	sweeping winds can damage	narrowleaf evergreen	will not tolerate air pollution
Scotch Pine	easy; B & B if root pruned	root rot; tip blight; many rusts; nematodes a serious problem	pine tip moth	prune candles to shape; June	varies in needle length and color	leaves last several years	popular Christmas tree
Hemlock	easy; B & B if root pruned	leaf blight; canker rust; needle rust; sapwood rot	scale in eastern states; hemlock borer; bagworms; gypsy moth	reponds well to clipping for low or high mass effect; can be trained to thick hedge	sun scorched when temperature 95°F and above; susceptible to salt injury	NA	NA

TABLE 12 - FLOWERING SHRUB SELECTION

Berberis thunbergii - Japanese barberry

Cornus sericea - redosier dogwood

Chaenomeles speciosa - flowering quince

Euonymus alatus - winged euonymus or burning bush

Forsythia x intermedia - border forsythia

Ligustrum japonicum - wax leaf privet

Nandina domesticum - nandina or heavenly bamboo

Pyracantha coccinea - scarlet firethorn

Salix gracilistyla - rosegold pussy willow

Spirea vanhouttei - Vanhoutte spirea

Syringa vulgaris - common lilac

Table 12 - Flowering Shrub Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	COLOR (LEAF)
Japanese Barberry	*Berberis thunbergii*	3-6'	4-7'	rounded; dense	medium; space 3' apart	4	hedge; foundation; specimen; mass barrier; shrub border	medium green; reddish in fall
Redosier Dogwood	*Cornus sericea*	7-9'	10'	broad-spreading, multi-stemmed	fast	2	specimen; mass; shrub border	medium green; purplish in fall
Flowering Quince	*Chaenomeles speciosa*	6-10'	6-10'	rounded to irregular	medium; space 4' apart	4	shrub border; specimen; mass; barrier	glossy, dark green; yellow in fall
Winged Euonymus or Burning Bush	*Euonymus alatus*	15-20'	15-20'	upright; flat top; rounded	medium to slow; space 5' apart	3	specimen; naturalistic mass; barrier; hedge; screen	dark green; brilliant red in fall
Border Forsythia	*Forsythia x intermedia*	6-10'	10-12'	rounded with arching branches	medium to fast; space 4' apart	5	specimen; border; mass; screen;	mdeium green; bronze in fall
Wax Leaf Privet	*Liqustrum japonicum*	6-10'	6-8'	rounded; upright to spreading;	fast; space 5' apart	7-10	residential and large scale; screen; border; hedge	glossy, dark green
Nandina or Heavenly Bamboo	*Nandina domestica*	4-5'	2-3'	upright; irregular	medium to fast; space 2' apart	6-10	specimen; containers; mass	medium green; bright red in fall
Scarlet Firethorn	*Pyracantha coccinea*	6-15'	10'	upright; rounded; irregular	fast; space 8' apart	6	specimen; barrier; screen; hedge	glossy, dark-green
Rosegold Pussy Willow	*Salix gracilistyla*	6-10'	5-8'	rounded	extremely fast	5	specimen; barrier; screen	bluish-gray
Vanhoutte Spirea	*Spirea vanhouttei*	5-8'	5-8'	rounded with pendulous branches	fast; space 4' apart	5	shrub border; foundation	pale bluish-green upperside; lighter underside; bronze-yellow in fall
Common Lilac	*Syringa vulgaris*	8-10'	6-12'	upright; irregular; multi-stemmed; leggy	medium; space 8' apart	3	shrub border; massing	dark green; no fall color

Table 12 - Flowering Shrub Selection continued

FLOWERING COLOR, LENGTH OF BLOOM	FRUITING TIME/TYPE	TEXTURE	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TEMPERATURE REQUIREMENTS
not showy; small yellow flowers in early spring	red berries in October that persist into winter	fine to medium	wide range; well-drained; acidic to alkaline	moist to dry; withstands drought	medium	sun to part shade; best in full sun	to zone
white 1 1/2 to 2 1/2" flowers in late May to June	white 1/5" berry-like fruits in September	medium	wide range	moist to wet	medium	sun	to zone
red, white, or pink flowers in early spring (March)	yellowish-green pomp in late summer	medium	wide range; well-drained	medium	medium; chlorosis in alkaline soils	sun to part shade	to zone
not important	4-lobed capsule; red to orange	medium	wide range; acidic to alkaline; well-drained	medium to dry	medium to low	sun to part shade	to zone
bright yellow flowers in early spring that last 2-3 weeks	not important	medium	wide range; well-drained; acidic to alkaline	low to medium	medium	sun to part shade; best in full sun	to zone
white 4-6" fragrant, showy clusters in June and July	black clusters in fall and winter	medium to coarse	wide range; acidic to alkaline; medium drainage	medium; drought resistant	medium	sun to part shade	to zone; severe winters will kill twigs
showy white panicles in mid-summer	red cluster in fall and winter	fine	wide range; loam; pH 5.0-6.5; chlorosis in alkaline soils	drought resistant	low	sun to part shade	heat resistant; dies back at 0°, loses leaves at 10°
showy white clusters in June	bright orange-red clusters that persist into winter	medium	wide range; well-drained, acidic to alkaline	medium to dry	medium	sun to part shade; better flowers in full sun	to zone
showy; 1 1/4" long; pinkish-reddish tinged catkins	capsule that contains cottony or silky, hairy seeds	fine	well-drained; deep, not chalky soil	moist	medium to low	sun	to zone
white showy flowers in late spring	not important	medium to fine	wide range, pH 6.0-7.0	medium	medium	sun to part shade	to zone
white, pink, purple, or blue fragrant flowers in late spring	not important	medium to coarse	wide range; neutral pH	medium to low	medium to low	sun	to zone

Table 12 - Flowering Shrub Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	LIFE SPAN	SPECIAL CONSIDERATIONS	OTHER COMMENTS
Japanese Barberry	easy; bare root	bacterial leaf spot; anthracnose; root rots; wilt	barberry aphid; scale	anytime	medium	many thorns; good fall color	some clutivars have purple foliage; collects trash
Redosier Dogwood	easy; bare root or B & B	stem canker	scales; bagworms	to keep yellow color prune old wood	medium	good fall color; attractive red stem in winter	spreads by underground stolons
Flowering Quince	easy; B & B	leaf spot	scale; aphids	prune to 6" aboveground after spring bloom or annually; thin stems after blooming	medium	only showy 2 weeks of year in spring; thorny; collects trash	fruit good for jellies; thornless varieties available
Winged Euonomous or Burning Bush	easy; B & B	none serious	none serious	withstands pruning	long	sensitive to salt; excellent fall color in sun	compact varieties (5') are the common plants in nurseries
Border Forsythia	easy; bare root or B & B	crown gall; leaf spots; forsythia stem gall	spider mites	prune after flowering; remove older stems	medium	late frosts can kill blooms; not for foundation planting	attractive arching branch pattern in winter; overused
Wax Leaf Privet	easy; B & B	none serious	none serious	after flowering	medium	showy, fragrant flowers	wildlife food
Nandina Heavenly Bamboo	easy	none serious	none serious	after flowering	medium	plant in groups for cross pollination; protect from southwest winds	wildlife food
Scarlet Firethorn	difficult; container; in spring	fireblight; scab on fruit; twig blight; root rot	scale; lace bug; aphids	needed to keep in bounds; any time	long	fruit produced on 2-year wood; fruit has nice character	wildlife food; thorns
Rosegold Pussy Willow	easy; container or B & B	bacterial twig blight; crown gall; leaf blight; powdery mildew; rust; scabs	lace bug; aphid; willow flea; weevil borer; scale	summer or fall	long	showy male flowers	
Vanhoutte Spirea	easy	none serious	aphids	should not be sheared; best to prune to base; prune after flowering	long	very showy flowers	good shrub border plant
Common Lilac	easy	powdery mildew; bacterial blight	borer; scale	needs constant grooming annually after blooming; remove 1/3 of oldest canes	long	fragrant flowers	best for cool climates; renew old overgrown plants; sensitive to air pollution

TABLE 13 - EVERGREEN SHRUB SELECTION

Buxus microphylla - Korean boxwood littleleaf boxwood

Euonymus kiautschovicus - spreading euonymus

Ilex crenata "Helleri" - Japanese holly

Juniperus chinensis "Hetzii" - hetzii juniper

Juniperus chinensis "Phitzeriana" - phitzer juniper

Mahonia aquifolium - Oregon grape holly

Pinus mugo - mugo pine

Rhododendron catawbiense - catawba rhododendron

Taxus cuspidata - Japanese yew

Thuja occidentalis - Eastern or American arborvitae or white cedar

Viburnum rhytidophullum - leatherleaf viburnum

Table 13 - Evergreen Shrub Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINES ZONE	USE IN LANDSCAPE	COLOR (LEAF)
Korean Boxwood or Littleleaf Boxwood	*Buxus microphylla*	3-4'	3-4'	compact; rounded	moderate to slow; space 2' apart	5; hardiest of species	specimen; hedge; mass grouping; container; foundation; border;	green, yellow to brownish-green in winter
Spreading Euonymus	*Euonymus kiautschovica*	6-8'	8-10'	broadly oval	fast; space 6' apart	5	natualistic; espalier; screens, informal hedge, massing	green; rusty-green in winter
Japanese Holly	*Ilex crenata "Helleri"*	2-4'	3-4'	compact; dense; rounded	slow; space 2' apart	5	containers (will trail over); hedge; foundation; patio; border	dark green
Hetzii Juniper	*Juniperous chinensis "Hetzii"*	15'	15'	upright; spreading	fast; space 5' apart	4-10	screen; foundation; dry, windswept slope; mass; specimen	blue-green
Pfitzer Juniper	*Juniperus chinensis "Pfitzeriana"*	6'	6-8'	wide-spreading;	medium to fast; space 5' apart	4	specimen; mass; screen; hedge	gray-green; needle-like
Oregon Grape Holly	*Mahonia aquifolium*	3-9'	3-5'	upright; irregular	slow--2' to 3' over 3 to 4 years	5	shrub border; foundation; specimen	dark green; holly-like, purplish-bronze in fall
Mugo Pine	*Pinus mugo*	10-20'; "compacta" 4 to 5'	25-30'; "compact a" 4 to 5'	mounded	slow; space 4' apart	2	accent; specimen; rock gardens; residential scale; mass; foundations	medium green needles; 2 in a bundle
Catawba Rhododendron	*Rhododrendron catawbiense*	6-10'	6-8'	rounded	slow to medium; space 4' apart	4	mass; specimen; under-story; woodland area	dark green; yellow-green underside
Japanese Yew	*Taxus cuspidata*	4-6'	5-7'	broad oval; compact; irregular	slow; space 4' apart	4	foundation; hedge; screen border; mass	dark green; yellowish underside
Eastern or American Arborvitae or White Cedar	*Thuja occidentalis*	40-60'	10-15'	pyramidal	slow to medium	2	hedge; screen; windbreak;	dark green; brownish yellow in winter
Leatherleaf Viburnum	*Viburnum rhytidophyllum*	8-10'	6-8'	upright; oval to round; loosely branched	medium; space 5' apart	6	specimen; shrub border; accent	dark green; light to white under-side; leathery

Table 13 - Evergreen Shrub Selection continued

FLOWERING COLOR, LENGTH OF BLOOM	FRUITING TIME/TYPE	TEXTURE	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TEMPERATURE REQUIREMENTS
fragrant terminal clusters; not important	capsule	fine	well-drained; high organic matter; best in slightly acidic soils	medium	medium	sun to part shade	protect from drying winds and extreme low temperature
showy, small, greenish-white clusters in August	pale green; orange in fall and winter; showy; November	medium to coarse	wide range; acidic to alkaline; fertile to poor	medium	medium	sun to part shade	may die back in winter with cold temperature
not important	1/4" black berry-like fruit in September	fine	medium drainage; pH 5.0-6.0; loam	medium	high each year	sun to part shade, part shade if poor soil	to zone
not important	bluish-gray; fall and winter; colorful	fine	wide range; well-drained; prefers alkaline, though tolerates acid	medium, does well in dry areas	medium	full sun, will grow in part shade	to zone
not important	small cones	fine	wide range; alkaline; tolerates acid; well-drained; good for rocky soils	medium	medium	sun to part shade	to zone
bright yellow flowers in late April; slightly fragrant	grape-like true berry; blue-black with 1/3" bloom on surface; August to September	medium	acidic; well-drained	moist	medium	shade	not in hot sun or wind
not important	cones; not important	medium	wide range; prefers deep, moist, loam	medium	medium	sun to part shade	to zone
rosy-lilac to magenta-purple and white in early summer; very showy	capsule	bold-coarse	well-drained; organic acid soil	medium to high	medium	best in part shade	to zone
not important	red-coated on female only	medium to fine	well-drained; acidic to alkaline soil	medium to high	medium	sun to shade	to zone
not important	1/3 to 1/2" long; yellowish cones	medium-fine	well-drained; marshy; loam; tolerates alkaline soil	high humidity; medium to moist	medium	sun	to zone
creamy-white terminal cluster 4"-8" across in late spring	not important	coarse	medium drainage; acidic to alkaline	medium	fertilize each year	shade to part shade	to zone

Table 13 - Evergreen Shrub Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	LIFE SPAN	SPECIAL CONSIDERATIONS	OTHER COMMENTS
Korean Boxwood or Littleleaf Boxwood	easy; B & B or container	canker; blight; leaf spot; root rot	mealy bugs; boxwood leaf miner; giant hornet; boxwood webworm	prune to remove dead twigs	long	don't cultivate around as roots are close to surface	hardier than common boxwood; broadleaf evergreen
Spreading Euonymus	easy	mildew; anthracnose; crown gall; leaf spot	aphids; thrips; scale	some varieties may be tree form if pruned	long	flowers attract flies; not good for patio	leaves droop in winter
Japanese Holly	easy	none serious	none serious	can be sheared into formal shapes	medium	attractive light reflective ability	a hardier variety
Hetzii Juniper	easy	phomopsis twig blight	bagworms	anytime	long	not applicable	not applicable
Pfitzer Juniper	easily; B & B or container	phomopsis blight	bag worms; juniper scale; mites; aphids	specimens may be pruned to tree forms	long	sometimes found to grow taller than listed	good landscaping cultivars are available
Oregon Grape Holly	medium	leaf rust; leaf spot; leaf scorch	barberry aphid; scale; whitefly	annually, just after flowering	medium	good yellow flowers and grape-like fruit	unsweeping winds and winter sun cause leaf scorch
Mugo Pine	easy; B & B if root pruned	rusts; wood rots	borer; scale	prune annually to keep dwarf	long	slow growing	confusing due to variety of sizes; compact varieties used most often
Catawba Rhododendron	B & B or container	botrytis blotch; blights; gray blight; canker; crown rot; powdery mildew	leaf hopper; whiteflies; mealybugs; borer; scales thrips	after flowering	long life if in good conditions	protect from winter sun and wind; mulch at all times;	must have good conditions
Japanese Yew	easy; B & B	none serious	none serious	anytime	long	tolerates city conditions	hardiest yew; lots of good varieties
Eastern or American Arborvitae or White Cedar	easy	leaf blight; tip blight; juniper blight; cedar tree canker; leaf browning and shreding	bagworm; arborvitae aphid; leaf miner; mites; mealybug; scale	tolerant; prior to growth in spring	long	high winds, snow, and ice can damage; has tansy-odor when bruised	other varieties turn ugly yellow-brown in winter
Leatherleaf Viburnum	easy; B & B	none serious	none serious	prune after flowering	long	hardiest of evergreen viburnums	best with protection from sun and wind

TABLE 14 - GROUND COVER AND VINE SELECTION

Ajuga reptans - ajuga or bugleweed

Celastrus scandens - American bittersweet

Coronilla varis - crown vetch

Euonymus fortunei radicans - bigleaf wintercreeper

Hedra helix - English ivy

Juniperus horizontalis - creeping juniper

Lonicera japonica Halliana' - Hall's honeysuckle

Vinca minor - creeping myrtle or periwinkle

Table 14 - Ground Cover and Vine Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	COLOR (LEAF)
Ajuga or Bugleweed	*Ajuga reptans*	3-6"	spreading	mat-like clump	fast; may be invasive	3	ground cover: rock garden, edging, border	shiny green, burgundy
American Bittersweet	*Celastrus scandens*	20'	15-20'-variable, space 12" apart	spreading	fast	3	Vine: screen with support from walls, trellises, or arbors	bright yellow in fall
Crown Vetch	*Coronilla varis*	9-18"	20"; space 24" apart	sprawling, spreading	fast	4	ground cover: steep banks, rock garden, highway erosion control; too coarse for most gardens	gray-green
Bigleaf wintercreeper	*Euonymus fortunei "Radicans"*	6-7' vine; 12-24" ground cover	variable	irregular spreading	medium to fast	4	ground cover or shrub vine; will grow as vine with support	dark green
English Ivy	*Hedra helix*	6-10" as ground cover	variable; space 12" apart	spreading	fast	6	vine: trellis cover; ground cover: planter box, lawn substitute; deep roots good for erosion control	mature--deep green upperside, yellow-green underside; young--light green
Creeping Juniper	*Juniperus horizontalis*	12-16"	10'; space 8' apart	irregular spreading	moderate	2	ground cover: rock gardens; hangs over a wall	blue-green; greenish-purple in winter
Hall's Honeysuckle	*Lonicera japonica "Halliana"*	as ground cover 6" mound	20-30'; space 6-10' apart	spreading	fast	3	vine: to cover bank or fence when controlled	dark green
Creeping Myrtle or Periwinkle	*Vinca minor*	10"	moderate spread; space 12" apart	mat-forming	moderate	5	ground cover: rock garden, tub, hanging basket	blue-green

Table 14 - Ground Cover and Vine Selection continued

FLOWERING COLOR; LENGTH OF BLOOM	FRUITING TIME/TYPE	TEXTURE	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TERMPERATURE REQUIREMENTS
April to May; violet-blue to purple	not important	medium	tolerates poor soil; well-drained	medium	low to medium	shade--where grass will not grow; also part sun	to zone
inconspicuous	yellow and orange through winter	medium to coarse	any soil	medium	medium to low	sun to part shade; best fruiting in full sun	to zone
pink-purple in summer	not important	fine to medium	tolerates poor soils; well-drained, dry soils	low	low	full sun	to zone
not showy	many bright orange fruit through winter	medium	wide range of soil	moderately drought resistant	responds well to fertilizer	full sun to part shade	not hot, western exposure
inconspicuous, globe-shaped	not important	medium to coarse	wide range; fertile, moist, well-drained	moist	medium to high	grows well in shade; will take sun	to zone
inconspicuous	blue on a short stem, sometimes glaucous	fine	wide range of soils; grows well in sandy, rocky soils	moderately dry to dry	medium to low	sun; susceptible to fungus in shade	to zone
white, fragrant 2" flowers that yellow with age	black, fleshy berry	coarse	most any soil	drought-tolerant	medium	sun or light shade	to 20°F
bright blue (white and purple cultivars available); not showy	none	fine to medium	tolerates most soils	moderately tolerant of drought	medium	best in part shade or shade, but tolerates full sun	does not tolerate hot temperatures

Table 14 - Ground Cover and Vine Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	LIFE SPAN	SPECIAL CONSIDERATIONS	OTHER COMMENTS
Ajuqa Bugleweed	easy by division	crown rot from overcrowding or poor aeration	none serious	division	long		can remove flower stalks with a lawn mower set at a high setting
American Bittersweet	easy	none serious	Euonymus scale	heavy pruning required in late winter or spring to keep in bounds	long		need male and female to flower and fruit; 1 male per 6 female
Crown Vetch	by seed; 1 pound/1,000 sq. ft.	none serious	none serious	mow to 6", 2-3 times a year		legume-nitrogen fixer	
Big leaf wintercreeper	easy	mildew in shady, calm locations	Euonymus scale, stem gall, nematodes	clip back as needed	long		easy to grow
English Ivy	easy	bacterial leaf spot	spider mites	trim back when necessary and to enhance compact growth	long		
Creeping Juniper	easy	juniper blight	spider mites	trim back when necessary	long		
Halls Honeysuckle	easy	none serious	none serious	cut back heavily to keep in bounds	long	can be invasive; very vigorous	must keep in bounds, use as either vine or ground cover
Myrtle or Periwinkle	easy	none serious	none serious	shear annually to form dense growth	long		roots develop at nodes with contact with soil

TABLE 15 - PERENNIAL SELECTION

Artemisia schmidtiana - silver mound

Astilbe x ardendsii - false spirea astilbe

Aquilegia hybrids - columbine

Chrysanthemum x morifolium - garden mum

Coreopsis lanceolata - coreopsis

Hemerocallis hybrids - day lily

Heuchera sanquinea - coral bells

Hosta species - plantain lily or hosta

Liriope spicata - creeping lily turf

Phlox subulata - creeping phlox

Table 15 - Perennial Selection

COMMON NAME	BOTANICAL NAME	HEIGHT	WIDTH	FORM	GROWTH RATE	HARDINESS ZONE	USE IN LANDSCAPE	COLOR (LEAF)
Silver Mound	*Artemisia Schmidtiana*	4-6"	12"; space 8" apart	round mound	medium-slow	4	perennial border; specimen; rock garden; border	silvery-white
False Spirea Astilbe	*Astilbe x ardendsii*	4'	2'; space 2' apart	erect	medium-fast	5	border; wild gardens; water areas	green
Columbine	*Aquilegia hybrids*	2-3'	1'; space 9" apart	rounded erect stems	fast	4	naturalized settings; rock gardens; border	deep green
Garden Mum	*Chrysanthemum x morifolium*	1-3'	2 1/2'; space 12-18" apart	columnar to round mound	fast	5	border; mass plantings; late flower display	green to grayish-green
Coreopsis	*Coreopsis lanceolata*	2'	space 12" apart	upright, sprawling	fast	3	front or middle of border	dark green
Day Lily	*Hemerocallis hybrids*	depends on variety--20" to 3-4'	2'; space 18-36" apart	rounded upright	medium	4	mass planting; border	bright green
Coral Bells	*Heuchera sanguinea*	flower stalk--2', 10-12" tall	space 12" apart	round clump w/stalked flowers	medium-slow	4	for small areas; an edging or open border	dark, bright green
Plantain Lily or Hosta	*Hosta species*	2 1/2' tall	40"; space 30-36" apart	rounded mound	medium	3	border	bluish-green
Creeping Lily Turf	*Liriope spicata*	8-12" tall; flower scapes 10" tall	12" and spreading; space 12" apart	mound w/arching leaves	fast	4	ground cover; edging; rock garden	dark green; pale green in winter
Creeping Phlox	*Phlox subulata*	3-6"	2'; space 12-18" apart	prostrate mound; dense	fast	4	edging; walls; ground cover	bright green

Table 15 - Perennial Selection continued

FLOWERING COLOR; LENGTH OF BLOOM	TEXTURE	SOIL CONDITIONS	WATER REQUIREMENTS	FERTILIZING REQUIREMENTS	LIGHT REQUIREMENTS	TEMPERATURE REQUIREMENTS
small, white, or yellow flowers; not showy	fine	tolerates poor, sandy soil; well-drained	low; will rot in wet soils	low	full sun	hot
red, pink, white, or lavender spike-like flowers in June to July	medium	well-drained, fertile, moist	summer--dry; winter--dry	medium-high; fertilize each spring	full sun or partial shade	to zone
red, pink, yellow, blue, white, or purple flowers from May to June	medium-coarse	excellent drainage; sandy-loam soil	medium-high	medium	full sun; partial shade lengthens flowering season	to zone
yellow, orange, red, bronze, white, or lavender flowers from August to frost	medium-coarse	prefers well-drained, moist soil; well-drained soil essential for winter survival	high	heavy	full sun	to zone
bright yellow flowers from June to September	medium	well-drained; ordinary garden soil	medium	medium	full sun	to zone
many colors; 3-4 weeks at different times depending on variety; some are repeat bloomers	fine	well-drained, high inorganic matter, medium fertility moist soil	medium	medium	prefer sun, but will grown in partial shade	to zone
bell-shaped; red, coral, or pink 1/2" wide flowers on 2' stalks from June to September	coarse	well-drained, moist soil with high organic matter	medium-high	low	part shade is best	keep out of hot afternoon sun
white to pale lilac flowers in July	coarse	well-drained , moist; high in organic matter; no soggy soil	moist, not wet	low-medium	partial or deep shade	to zone
1/4" wide, pale violet to white flowers on sta¼s; 8-10"; summer	fine	well-drained, moist; fertile soil with organic matter added	moist	medium	partial shade to shade	to zone
red-purple, violet-purple, pink, and white flowers from March through May	fine	well-drained, gritty soils; alkaline	low-medium	medium-low	sunny or partial shade	to zone

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Table 15 - Perennial Selection continued

COMMON NAME	TRANSPLANT-ABILITY	DISEASE PROBLEMS	INSECT PROBLEMS	PRUNING METHOD AND TIME	LIFE SPAN	SPECIAL CONSID-ERATIONS	OTHER COMMENTS
Silver Mound	easy by root division	rust	none serious	prune foliage before flowering to keep plant from falling open in the middle	long	does not tolerate much winter moisture because of silvery coating on the leaves	
False Spirea Astilbe	easy	powdery mildew; wilt	Japanese beetles; spider mites	divide every 3 years	long		
Columbine	easy; divide in spring	leaf spot; crown rot; root rot; rust	leaf miner; columbine borer; aphids	none required	usually acts as annual	should be planted where fading leaves can be camouflaged by other foliage	can be used as cut flowers
Garden Mum	easy	bacterial blight; leaf spot; wilt; rust; powdery mildew; aster yellows	aphids; stalk borers; leaf miner; spider mites	can prune back early summer to maintain height; stop pinching in mid-summer or when flowering begins	long	shallow rooting causes need for regular watering; apply a light winter mulch	can be used as cut flowers; many cultivars available
Coreopsis	easy	leaf spot, rust, powdery mildew	chewing insects	remove faded flowers before they seed	long	not invasive like other varieties	
Day Lily	easy	none serious	none serious	divide most vigorous varieties every 3 years	long	individual blossoms last one day, but bloom over a long season	
Coral Bells	easy	none serious	none serious	divide when woody; remove faded blooms	long	drainage important in winter	
Plantain Lily or Hosta	easy	none serious	snails, slugs, and other chewing insects	remove faded blooming stalks	long	divide clumps as needed in spring or fall	wet soil in the winter can damage these plants
Creeping Lily Turf	easy	none serious	none serious	can mow over the top in early spring to remove old foliage; set mower blade high	long	foliage may be unattractive in winter north of zone 6	remove old foliage in spring to promote new growth
Creeping Phlox	easy	rust	spider mites	mow halfway to ground after flowering to form dense plant	long	evergreen	

TABLE 16 - TURFGRASS SELECTION

Cynodon dactylon - Bermudagrass

Festuca arundinacea - tall fescue

Festuca rubra - red fescue

Lolium perenne - perennial ryegrass

Poa pratensis - Kentucky bluegrass

Zoyzia japonica - zoysia grass

Table 16 - Turfgrass Selection

COMMON NAME	BOTANICAL NAME	HARDINESS ZONE	SEASON WARM/COOL	ANNUAL/ PERENNIAL	GROWTH HABIT	NATURAL HEIGHT	MOWING HEIGHT	SOIL TOLERANCE	FERTILIZING REQUIREMENTS
Bermuda Grass	*Cynodon dactylon*	7	warm	perennial	stolon, rhizome, creeping	12"	1-2"	rich, moist, pH 5.2-7.0	medium
Tall Fescue	*Festuca arundinacea*	5-8	cool	perennial	bunch	24-36"	1 1/2-3"	wide range, pH 5.3-7.5	medium
Red Fescue	*Festuca rubra*	3-6	cool	perennial	bunch	8"	3/4-1 1/2"	wide range; low pH	low
Perennial Rye Grass	*Lolium perenne*	3-7	cool	perennial	bunch	12-24"	1 1/2-2 1/2"	wide range	medium-low
Kentucky Bluegrass	*Poa pratensis*	3-7	cool	perennial	rhizome, creeping	12-24"	3/4-1 1/2"	fertile loam, pH 6.0-7.5	medium
Zoysia Grass	*Zoysia japonica*	6	warm	perennial	stolon, rhizome, creeping	12"	1/2-1"	well-drained, pH 5.5-7.0	medium

Table 16 - Turfgrass Selection continued

FERTILIZING TIME	MOISTURE REQUIREMENTS	LIGHT REQUIREMENTS	HOW ESTABLISHED	ESTABLISH-MENT TIME	RATE OF SEEDING (#/1,000 SQ. FT.)	RATE OF PLUGGING	WHEN TO ESTABLISH
3-4 x/year	good drought tolerance	full sun	seed or plug	rapid	2-3	6-12" apart	early summer
late fall, early spring	excellent drought tolerance	sunny; somewhate shade tolerant	seed	rapid	4-8 (K-31) 10-12 (Turf-type)	not applicable	early fall
late fall, early spring	good drought tolerance	sun or shade	seed	moderate	3-5	not applicable	early fall, early spring
early fall, early spring	not very drought tolerant	sunny; not very shade tolerant	seed	rapid	4-6	not applicable	early fall
early spring, early summer, early fall	not drought tolerant	sun in north; shade in south	seed	rapid	2-4	not applicable	early fall, early spring
early spring, mid. summer, early fall	excellent drought tolerance	sun to part shade	stolon	slow, 6-9 months	usually vegetatively propagated	6" apart	May

Table 16 - Turfgrass Selection continued

COMMON NAME	TEMPERATURE TOLERANCE	DISEASE PROBLEMS	INSECT PROBLEMS	USE	TEXTURE	COLOR	OTHER COMMENTS
Bermuda Grass	high heat	dead spot; brown patch; dollar spot	none important	parks; football fields; homes	fine	dark blue-green	salt tolerant; goes dormant
Tall Fescue	heat tolerant	leaf spot; brown patch; resistant to most diseases except snow mold	not many unless heavy populations; army worm; grubs; sod-webworm	utility; roadways, athletic fields, erosion prevention	coarse-wiry	medium green	
Red Fescue	not heat tolerant	fungus	none important	lawns	fine	dark green	don't over feed
Perennial Rye Grass	not heat tolerant	leaf spot rust	any worms; sod-webworms	lawns; high traffic areas	medium to coarse	bright green	sheaths have pinkish color
Kentucky Blue Grass	80°F	moderately resistant to most cool season diseases	grubs; cinch bugs; sod-webworms; cut worms; army worms	sunny lawns; athletic fields; parks	medium	blue-green	resistant to leaf spot
Zoysia Grass	high heat	nematodes; brown patch; dollar spot; Pythium	mole crickets; sod-webworms; Billbugs; grubs; army worms; mites; scales	golf course sand traps; lawns	medium	medium green	low maintenance; grows above 60°F

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